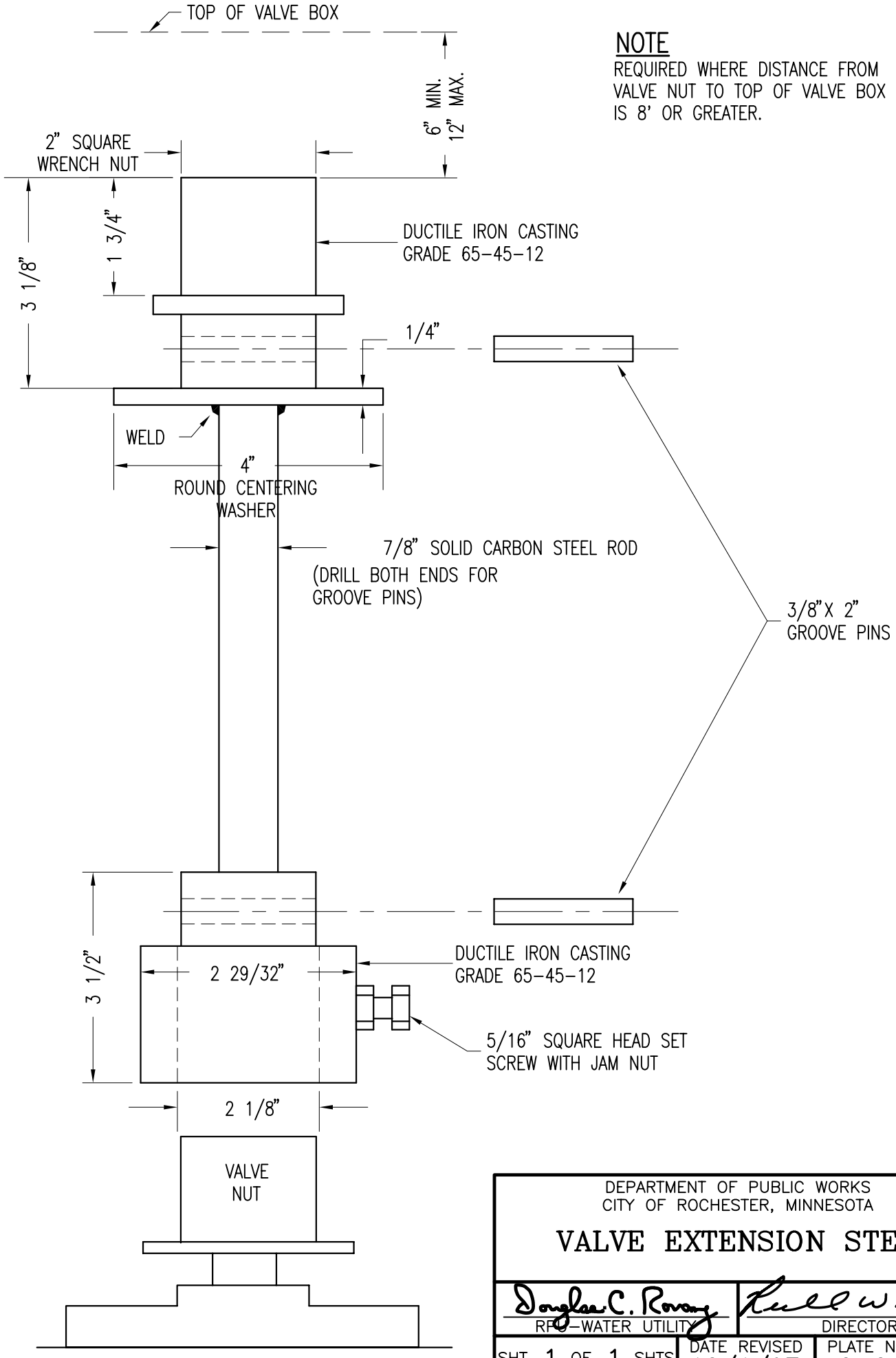


NOTE

REQUIRED WHERE DISTANCE FROM VALVE NUT TO TOP OF VALVE BOX IS 8' OR GREATER.

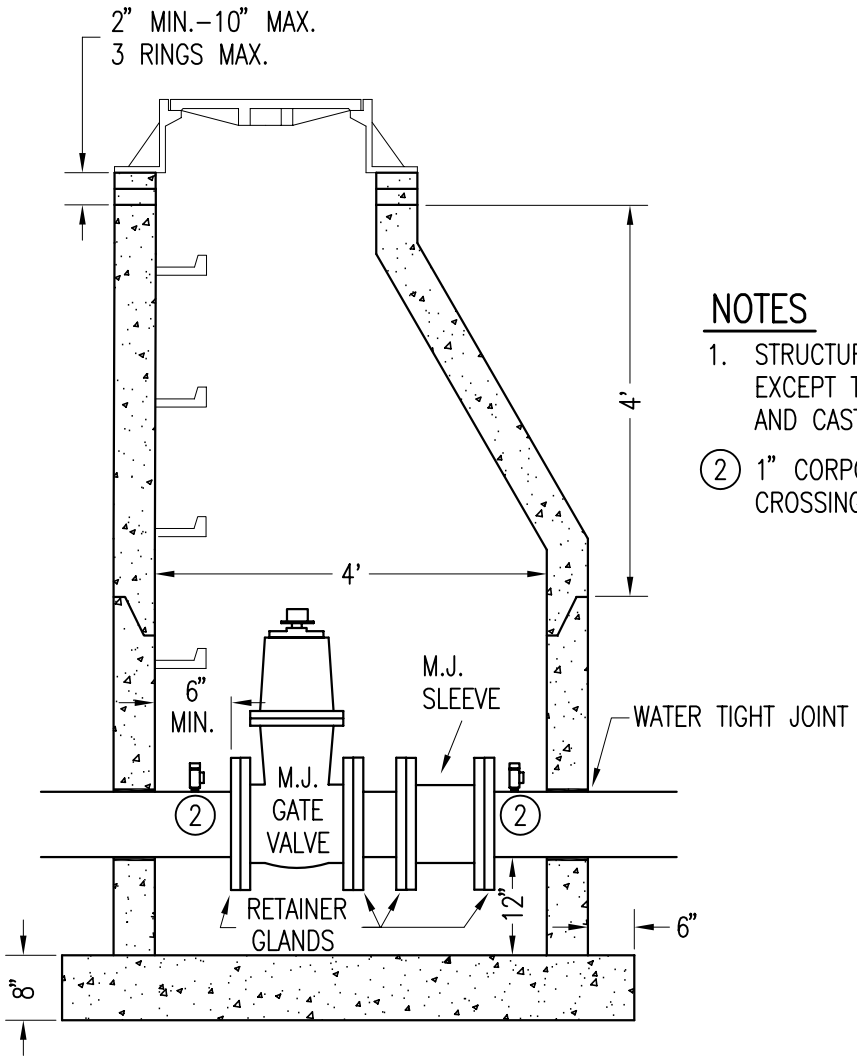
DEPARTMENT OF PUBLIC WORKS
CITY OF ROCHESTER, MINNESOTA

VALVE EXTENSION STEM

Douglas C. Rovang
RPU-WATER UTILITY

Russell W. Fries
DIRECTOR

SHT 1 OF 1 SHTS	DATE REVISED 10/1/97	PLATE NO. 6-01	REV. A

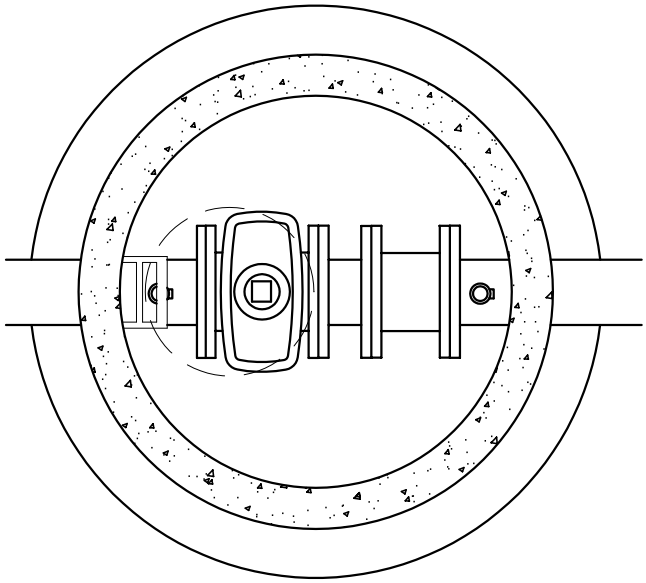


SIDE VIEW

NOTES

1. STRUCTURE SHALL BE PER S.D.P. 1–02 EXCEPT THAT CONE SHALL BE ECCENTRIC AND CASTING CENTERED OVER VALVE.

(2) 1" CORPORATION WHEN USED AT RIVER CROSSING.



TOP VIEW

DEPARTMENT OF PUBLIC WORKS
CITY OF ROCHESTER, MINNESOTA

VALVE MANHOLE

Douglas C. Rovang
RPU–WATER UTILITY

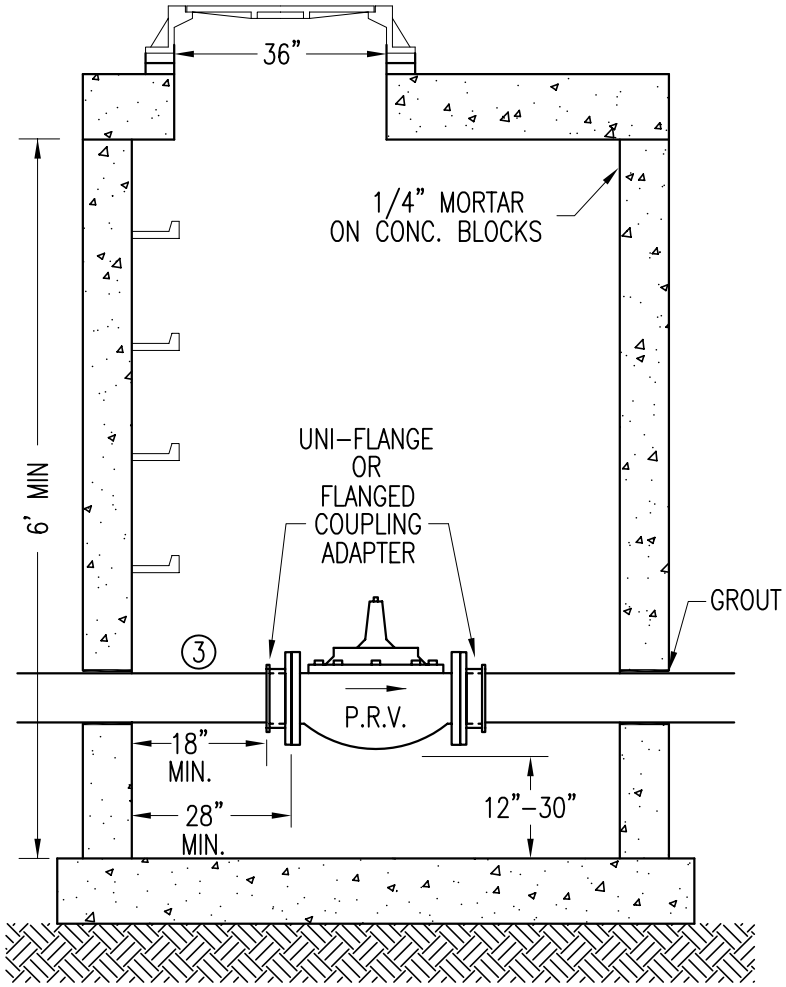
Russell W. Fries
DIRECTOR

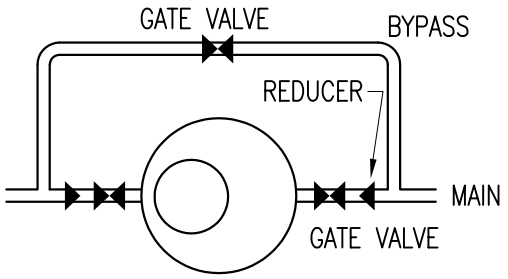
SHT 1 OF 1 SHTS	DATE REVISED 4/16/01	PLATE NO. 6–02	REV. B

NOTES

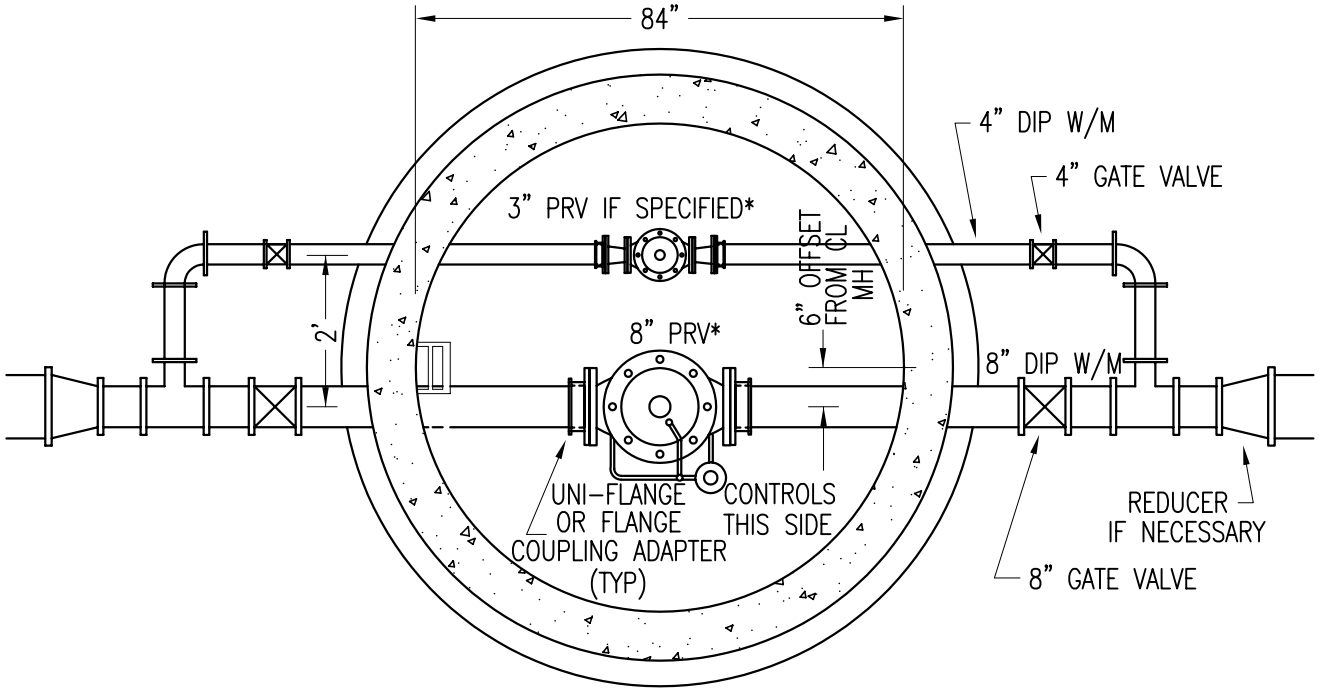
1. STRUCTURE SHALL BE AS PER S.D.P. 1–04.
2. P.R.V.'(S) TO BE FURNISHED BY ROCHESTER PUBLIC UTILITIES AND INSTALLED BY THE CONTRACTOR.

③ UNI–FLANGE OR FLANGED COUPLING ADAPTER ON THE HIGH PRESSURE SIDE OF THE P.R.V. SHALL BE RESTRAINED PER S.D.P. 6–05.





BYPASS
(NECESSARY FOR SINGLE PRV INSTALLATION ONLY)



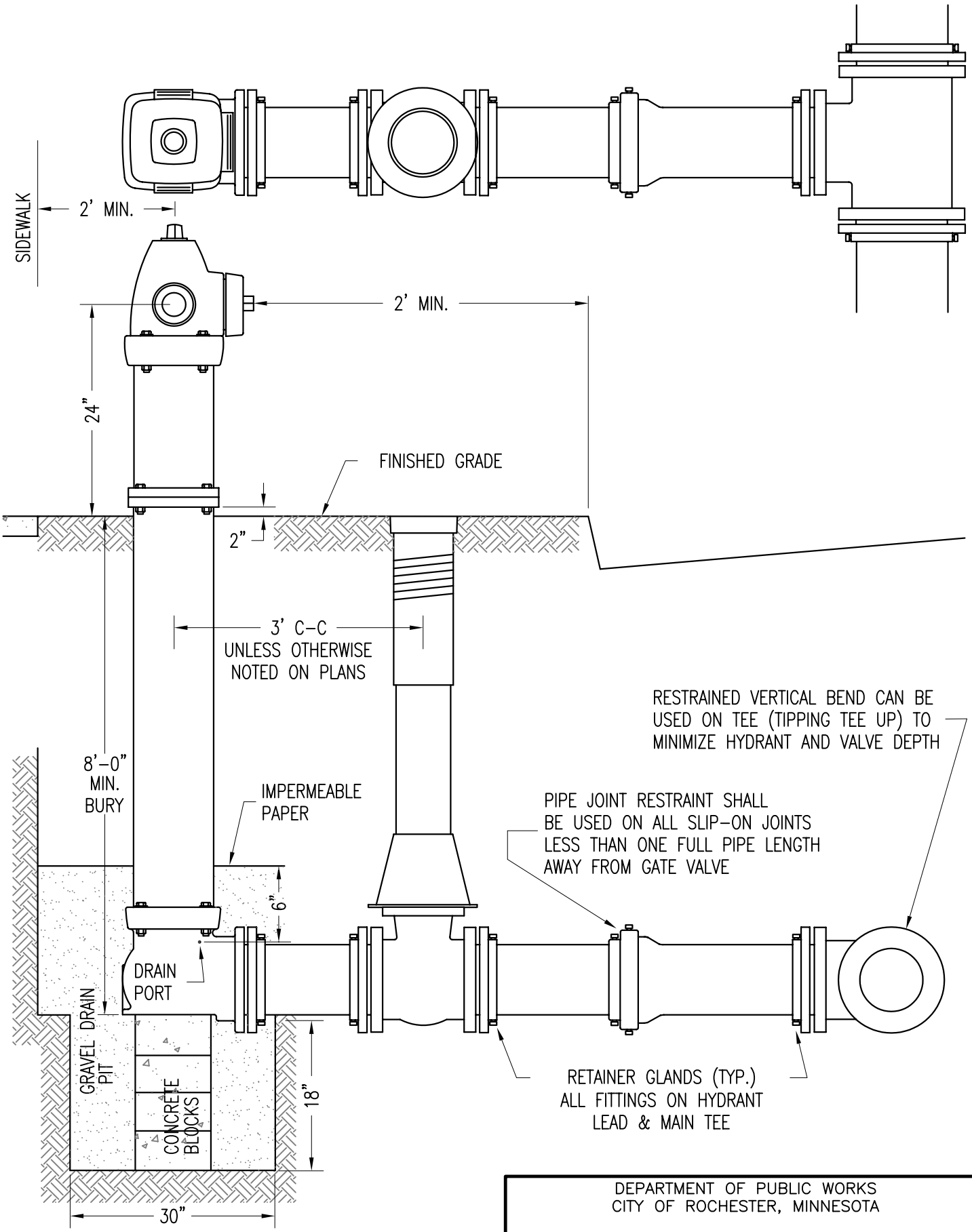
DEPARTMENT OF PUBLIC WORKS
CITY OF ROCHESTER, MINNESOTA

PRESSURE REDUCING VALVE MANHOLE

Douglas C. Rovang
RPU–WATER UTILITY

Russell W. Fries
DIRECTOR

SHT 1 OF 1 SHTS	DATE REVISED 6/15/07	PLATE NO. 6–03	REV. C



NOTE

CARE MUST BE TAKEN NOT TO PLUG THE HYDRANT DRAIN PORT WITH CONCRETE. DRAIN PORTS TO BE PLUGGED IF REQUIRED BY SPECIAL PROVISIONS.

DEPARTMENT OF PUBLIC WORKS
CITY OF ROCHESTER, MINNESOTA

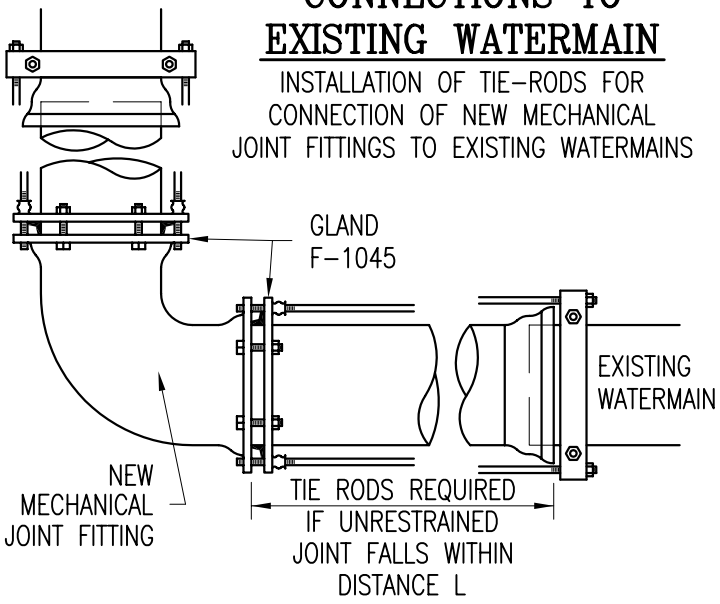
HYDRANT BRANCH DETAIL

RPU–WATER UTILITY	DIRECTOR

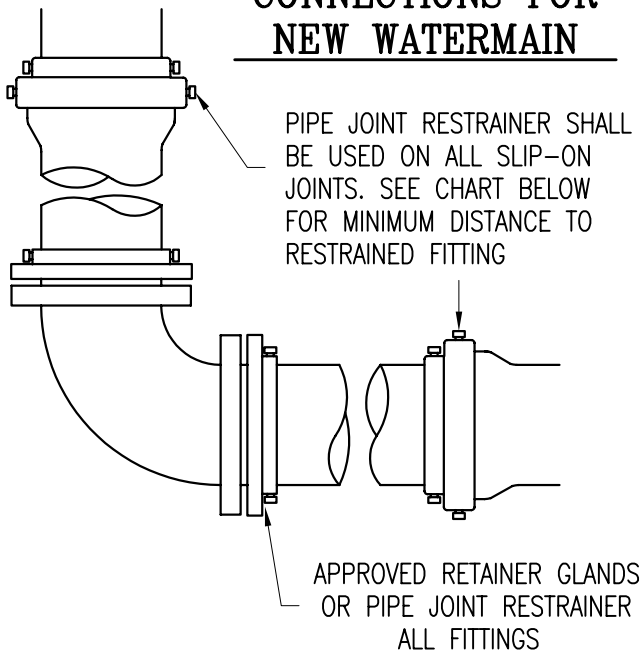
SHT 1 OF 1 SHTS	DATE REVISED 3/22/06	PLATE NO. 6–04	REV. C

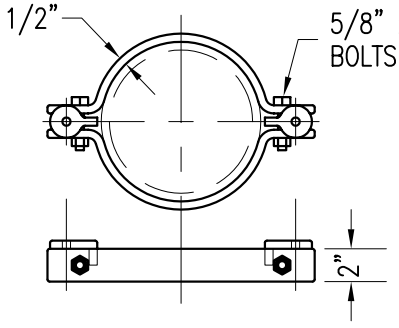
CONNECTIONS TO EXISTING WATERMAIN

INSTALLATION OF TIE-RODS FOR CONNECTION OF NEW MECHANICAL JOINT FITTINGS TO EXISTING WATERMAINS



CONNECTIONS FOR NEW WATERMAIN





SOCKET CLAMP FOR PIPE FITTINGS

NUMBER OF 3/4" RODS REQUIRED

PIPE SIZE INCHES	12" AND LESS	14" AND 16"	18" AND 20"	24"
NUMBER OF RODS	2	4	6	8

MINIMUM DISTANCE TO CLOSEST UNRESTRAINED JOINT (L IN FEET)

TYPE OF FITTING	PIPE SIZE							
	6"	8"	10"	12"	14"	16"	18"	20"
11 1/4° BEND	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
22 1/2° BEND	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
45° BEND	18.0	18.0	18.0	18.0	19.0	21.4	23.8	26.0
90° BEND	19.6	19.6	24.0	28.2	32.4	36.6	40.8	44.8
TEE	18.0	18.0	18.0	18.0	20.0	25.0	36.0	40.0
PLUG	18.0	18.0	18.0	18.0	20.0	25.0	36.0	40.0

NOTES

1. RODS TO BE GALVANIZED.

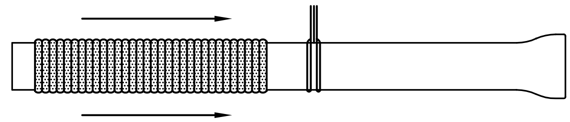
DEPARTMENT OF PUBLIC WORKS
CITY OF ROCHESTER, MINNESOTA

RESTRAINED JOINT DETAIL

Douglas C. Rovang — RPE-WATER UTILITY

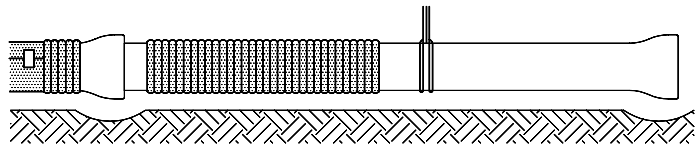
Russell W. Fries — DIRECTOR

SHT 1 OF 1 SHTS	DATE REVISED 6/15/07	PLATE NO. 6-05	REV. C



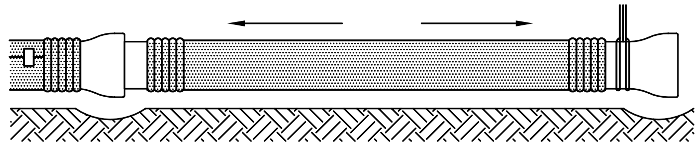
STEP 1

CUT A SECTION OF POLYETHYLENE TUBE APPROX. 2' LONGER THAN THE PIPE, REMOVE ALL MATERIAL THAT MIGHT HAVE ACCUMULATED ON THE PIPE SURFACE DURING STORAGE. SLIP THE TUBE AROUND THE PIPE. BUNCH THE TUBE ACCORDION–FASHION ON THE END OF THE PIPE. PULL BACK THE END OF THE TUBE UNTIL IT CLEARS THE PIPE END.



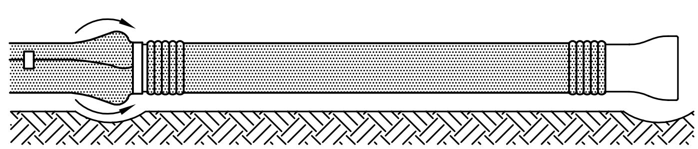
STEP 2

DIG A SHALLOW BELL HOLE IN THE TRENCH BOTTOM. LOWER THE PIPE INTO THE TRENCH AND MAKE UP THE PIPE JOINT WITH THE PRECEDING SECTION OF PIPE.



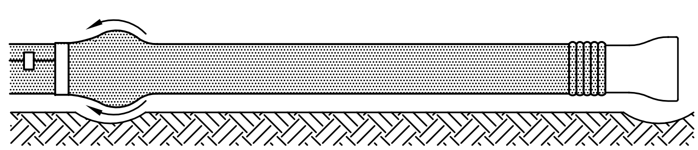
STEP 3

LIFT THE PIPE SLIGHTLY TO PROVIDE ENOUGH CLEARANCE TO EASILY SLIDE THE TUBE. NOTE: MAKE SURE THAT NO DIRT OR OTHER BEDDING MATERIAL BECOMES TRAPPED BETWEEN THE WRAP AND THE PIPE.



STEP 4

MAKE THE OVERLAP BY PULLING BACK THE BUNCHED POLYETHYLENE AND SECURING IT IN PLACE. NOTE: THE POLYETHYLENE MAY BE SECURED IN PLACE BY USING TAPE, STRING, OR ANY OTHER MATERIAL CAPABLE OF HOLDING IT SNUGLY AGAINST THE PIPE.



STEP 5

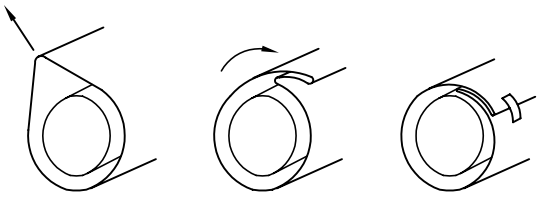
OVERLAP THE SECURED TUBE END WITH THE TUBE END OF THE NEW PIPE SECTION. SECURE THE NEW TUBE END IN PLACE.

DEPARTMENT OF PUBLIC WORKS
CITY OF ROCHESTER, MINNESOTA

POLYETHYLENE ENCASEMENT

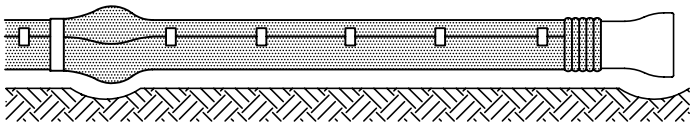
RPU–WATER UTILITY	DIRECTOR

SHT 1 OF 2 SHTS	DATE REVISED	PLATE NO.	REV.
	10/1/97	6–06	A



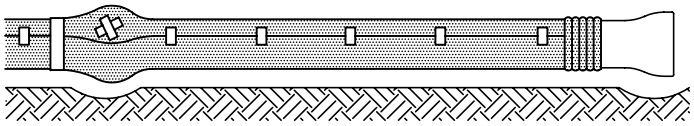
STEP 6

TAKE UP THE SLACK ALONG THE BARREL OF THE PIPE TO MAKE A SNUG, BUT NOT TIGHT, FIT. FOLD EXCESS BACK OVER THE TOP OF THE PIPE.



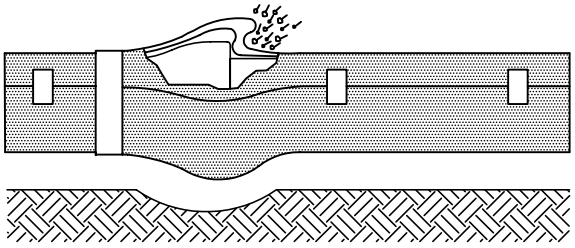
STEP 7

SECURE THE FOLD AT SEVERAL LOCATIONS ALONG THE PIPE BARREL (APPROXIMATELY EVERY 3').



STEP 8

REPAIR SMALL RIPS, TEARS, OR OTHER TUBE DAMAGE WITH ADHESIVE TAPE.



STEP 9

TO PREVENT DAMAGE DURING BACKFILLING, ALLOW ADEQUATE SLACK IN THE TUBE AT THE JOINT. AVOID DAMAGING THE POLYETHYLENE WHEN USING TAMPING DEVICES.

DEPARTMENT OF PUBLIC WORKS
CITY OF ROCHESTER, MINNESOTA

POLYETHYLENE ENCASEMENT

Douglas C. Rovang	Russell W. Fries
RPU–WATER UTILITY	DIRECTOR

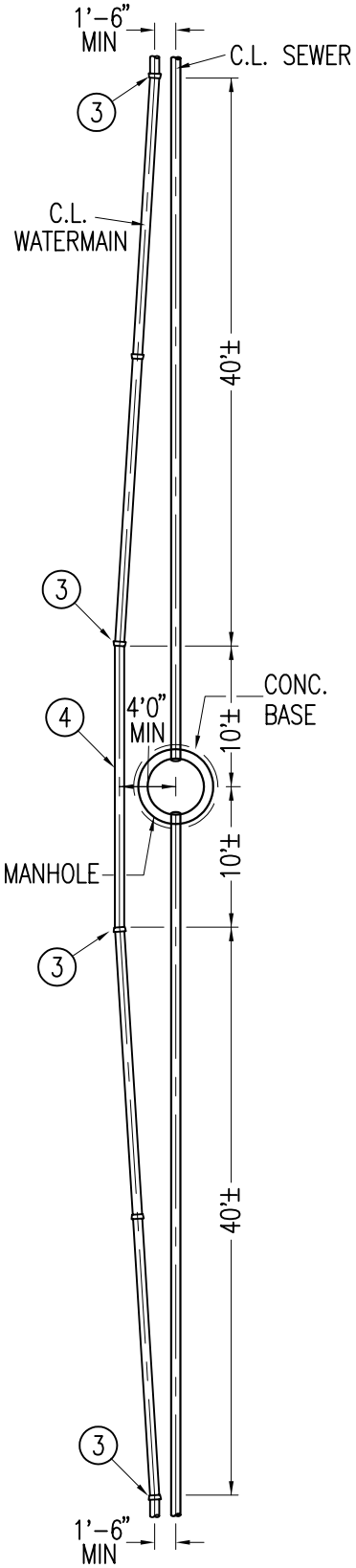
SHT 2 OF 2 SHTS	DATE REVISED 10/1/97	PLATE NO. 6–06	REV. A

NOTES

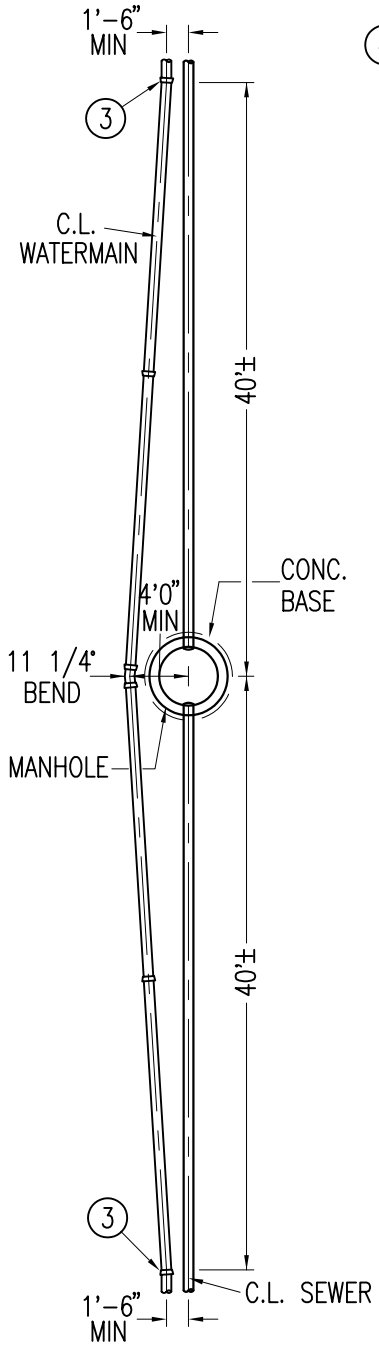
1. WHERE WATERMAIN IS AT HIGHER ELEVATION, THE TRENCH SHALL BE BACKFILLED & THE SELECT MATERIAL SHALL BE COMPACTED TO 95% OF DENSITY BEFORE PLACEMENT OF PIPE.
2. SANITARY SEWER TO BE PRESSURE PIPE SEWER.

(3) MAXIMUM DEFLECTION FOR WATERMAIN IS 5° AT EACH JOINT.

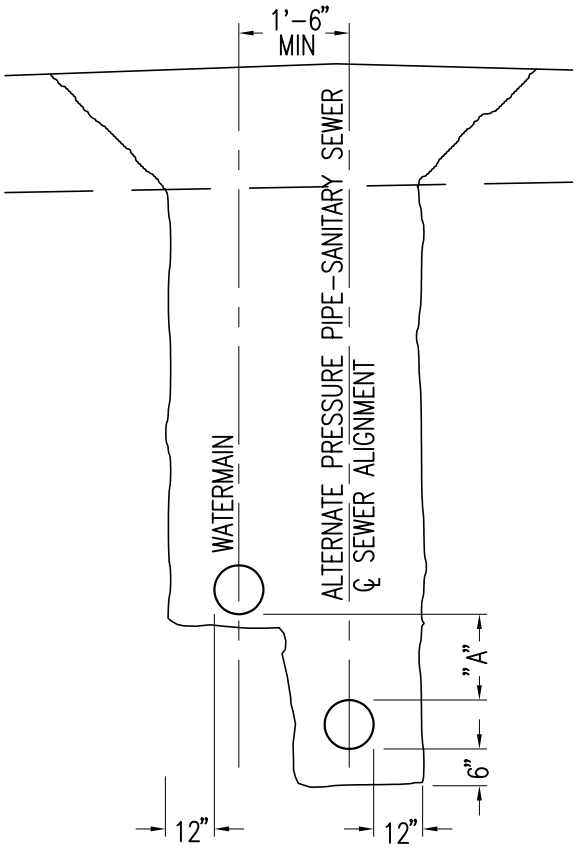
(4) CENTER ONE FULL LENGTH PIECE OF PIPE ON MANHOLE.



DETAIL WHEN DIMENSION "A" IS LESS THAN 18"



DETAIL WHEN DIMENSION "A" IS 18" OR MORE

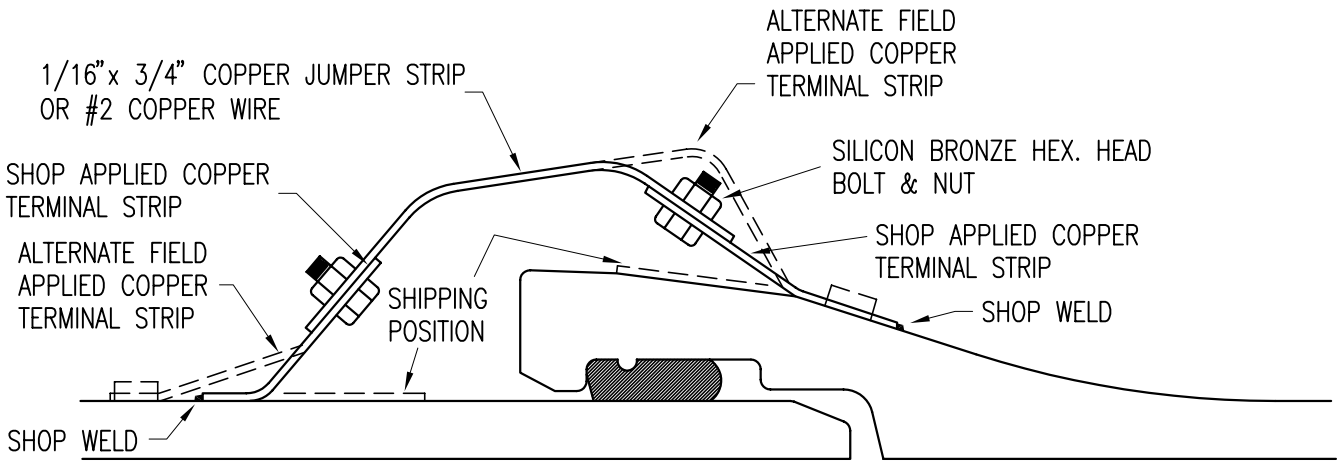


DEPARTMENT OF PUBLIC WORKS
CITY OF ROCHESTER, MINNESOTA

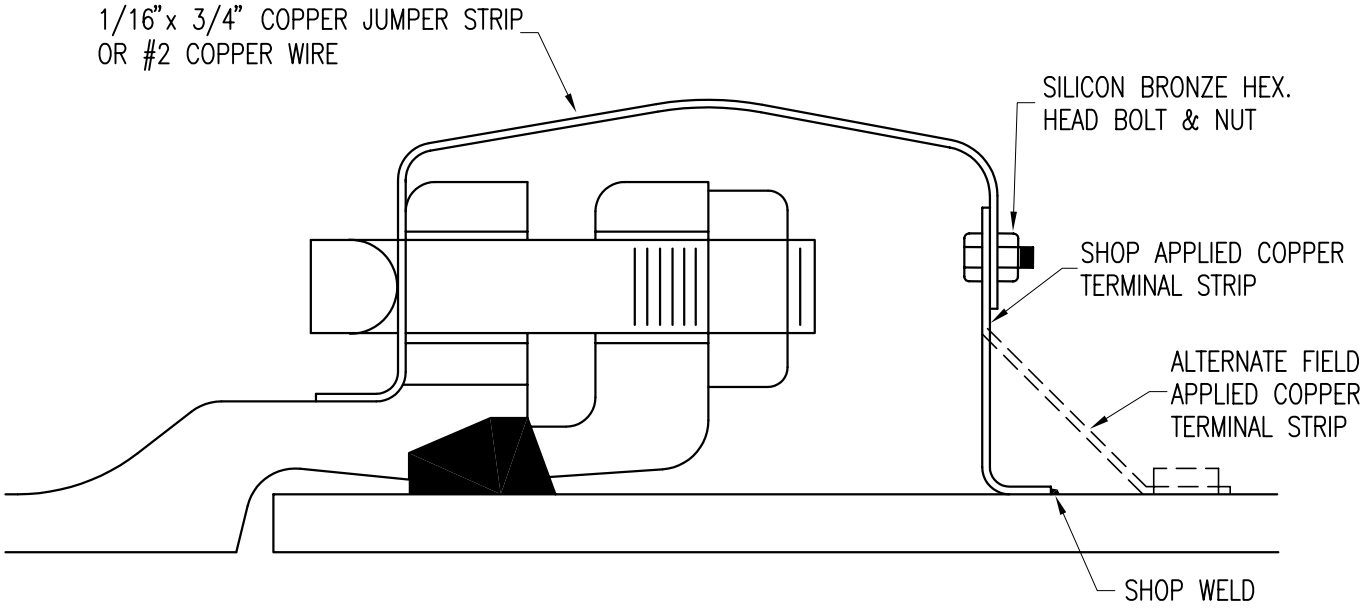
ALIGNMENT OF WATERMAIN AT SEWER MANHOLE IN COMMON TRENCH

Douglas C. Rovang	Russell W. Fries
RPU-WATER UTILITY	DIRECTOR

SHT 1 OF 1 SHTS	DATE REVISED	PLATE NO.	REV.
	8/15/02	6-07	C



PUSH ON PIPE JOINT



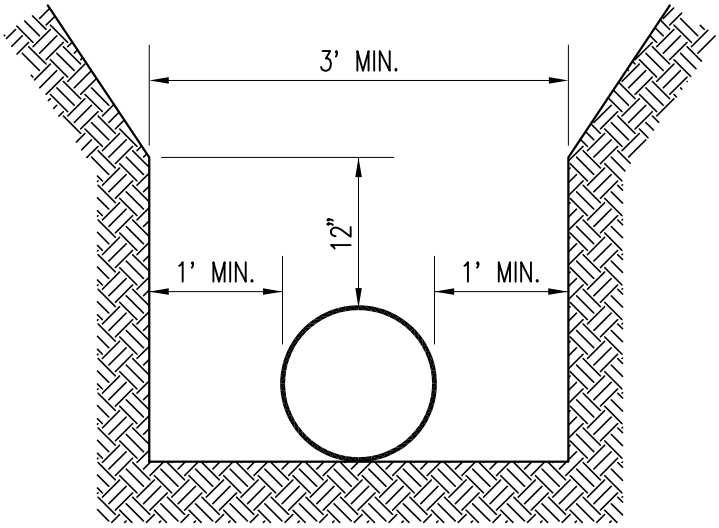
MECHANICAL PIPE JOINT

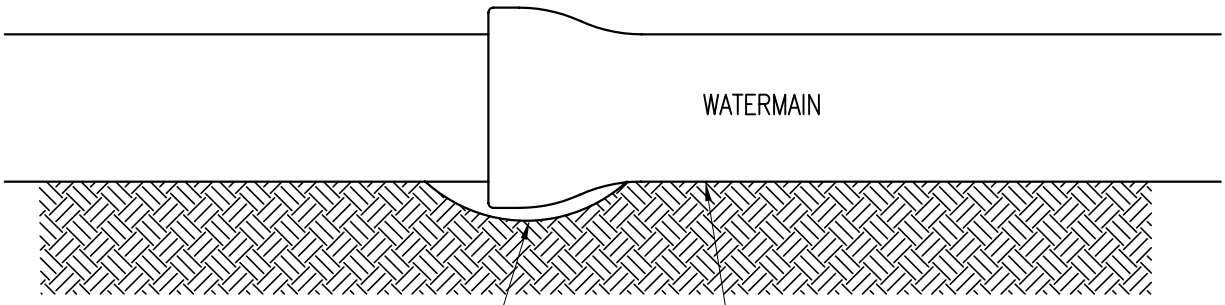
DEPARTMENT OF PUBLIC WORKS
CITY OF ROCHESTER, MINNESOTA

ELECTRICAL CONDUCTIVITY

Douglas C. Rovang	Russell W. Fries
RPU–WATER UTILITY	DIRECTOR

SHT 1 OF 1 SHTS	DATE REVISED	PLATE NO.	REV.
	4/16/01	6–08	B





BELL HOLES SHALL BE KEPT TO A MINIMUM SIZE

PIPE TO BE SUPPORTED FOR ENTIRE LENGTH WITH NO BLOCKING ALLOWED

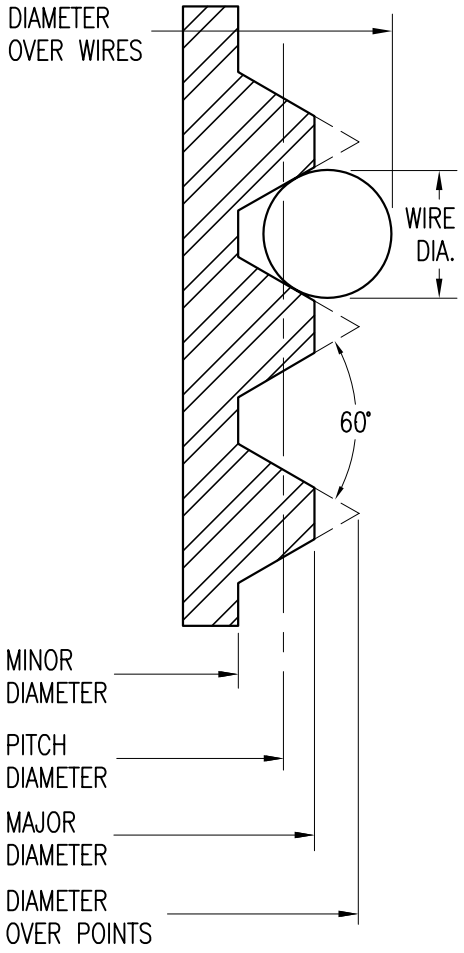
DEPARTMENT OF PUBLIC WORKS
CITY OF ROCHESTER, MINNESOTA

INSTALLATION DETAIL

Douglas C. Rovang
RPU–WATER UTILITY

Russell W. Fries
DIRECTOR

SHT 1 OF 1 SHTS	DATE REVISED 10/1/97	PLATE NO. 6–09	REV. A

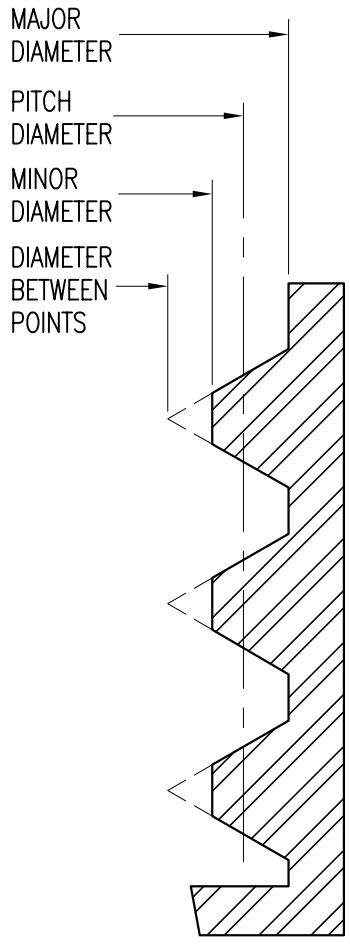


NIPPLE THREAD

THREADS PER INCH	8	
WIRE DIAMETER	0.072	
MAXIMUM DIAMETER OVER POINTS	4.983	INITIAL TURNED
MINIMUM DIAMETER OVER POINTS	4.967	DIMENSIONS
NOMINAL MAJOR DIAMETER	4.937	
MAXIMUM MAJOR DIAMETER	4.943	FINAL TURNED
MINIMUM MAJOR DIAMETER	4.912	DIMENSIONS
MAXIMUM PITCH DIAMETER	4.875	
MINIMUM PITCH DIAMETER	4.859	
MAXIMUM DIMENSION OVER WIRES	4.983	
MINIMUM DIMENSION OVER WIRES	4.967	
MAXIMUM MINOR DIAMETER	4.794	

RING GAGE DIMENSIONS

MAXIMUM PITCH DIAMETER	4.875
MINIMUM PITCH DIAMETER	4.862
MINIMUM MINOR DIAMETER	4.734



COUPLING THREAD

MINIMUM DIAMETER BETWEEN POINTS	4.791	INITIAL BORE
MAXIMUM DIAMETER BETWEEN POINTS	4.807	DIMENSIONS
MINIMUM MINOR DIAMETER	4.818	FINAL BORE
MAXIMUM MINOR DIAMETER	4.850	DIMENSIONS
MINIMUM PITCH DIAMETER	4.899	
MAXIMUM PITCH DIAMETER	4.915	
MINIMUM MAJOR DIAMETER	4.980	

PLUG GAGE DIMENSIONS

MAXIMUM PITCH DIAMETER	4.912
MINIMUM PITCH DIAMETER	4.899
MAXIMUM DIAMETER OVER WIRES	5.020
MINIMUM DIAMETER OVER WIRES	5.007
MAXIMUM MAJOR DIAMETER	5.000

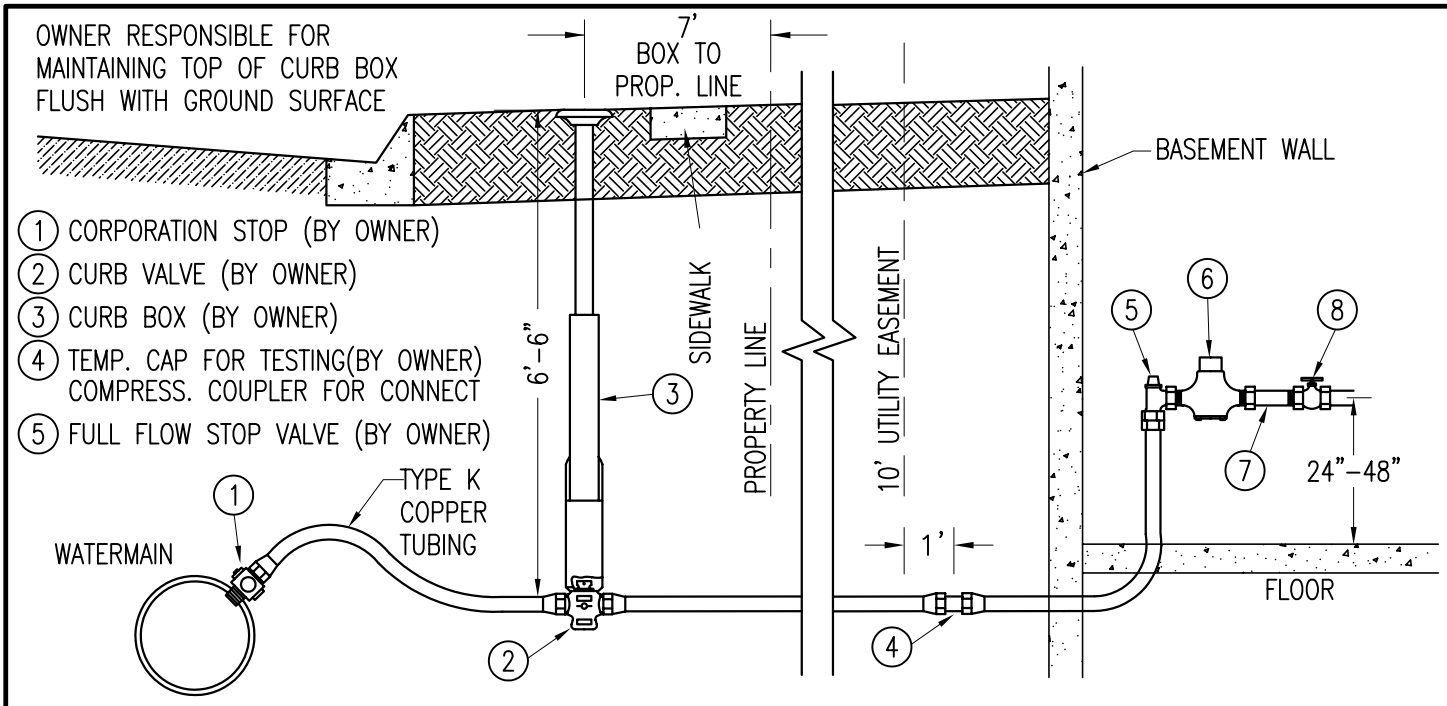
THREAD DATA:
4 15/16 O.D.
x 8 THDS./IN.

DEPARTMENT OF PUBLIC WORKS
CITY OF ROCHESTER, MINNESOTA

FIRE HYDRANT THREAD PATTERN (4in. NOZZLE)

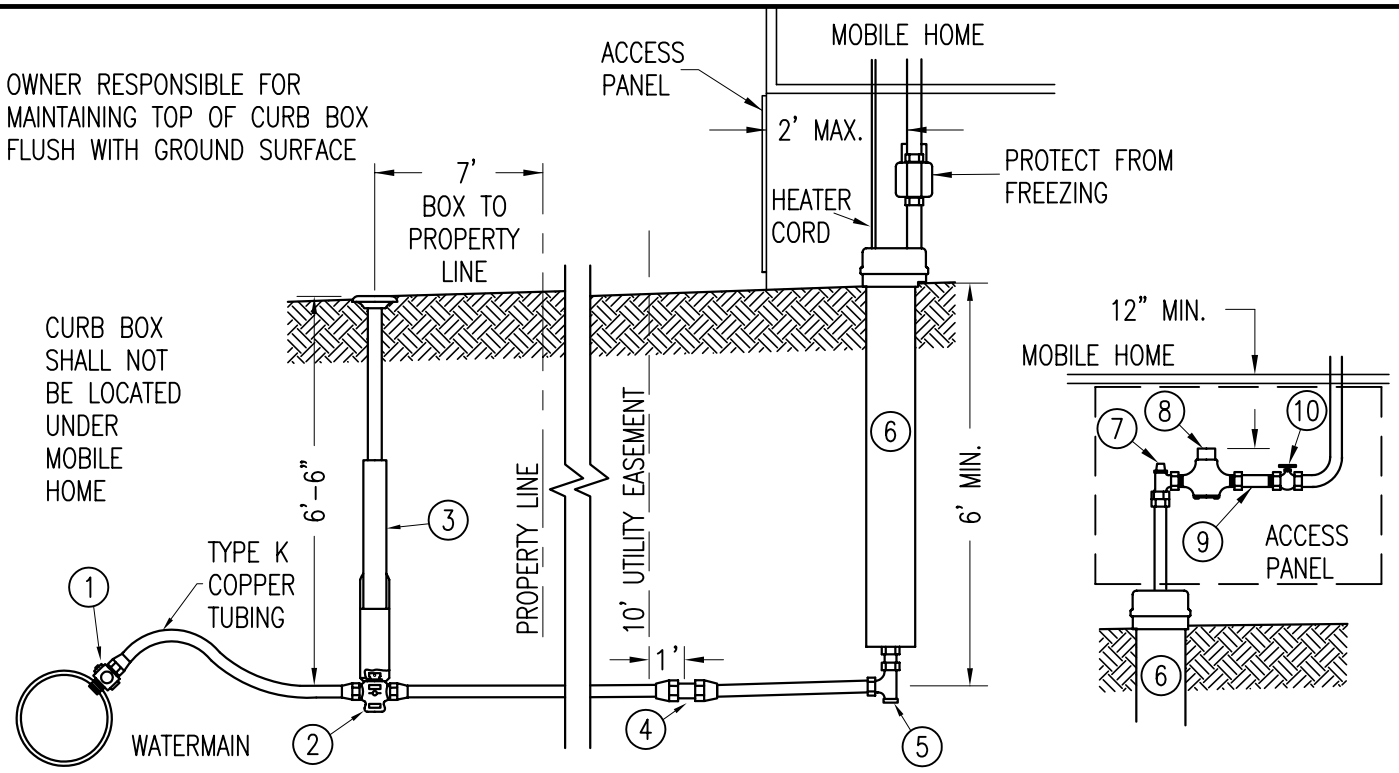
Douglas C. Rovang REG—WATER UTILITY	Russell W. Freese DIRECTOR

SHT 1 OF 1 SHTS	DATE REVISED	PLATE NO.	REV.
	10/1/97	6—10	A



1. CORPORATION STOP (BY OWNER)
2. CURB VALVE (BY OWNER)
3. CURB BOX (BY OWNER)
4. TEMP. CAP FOR TESTING(BY OWNER) COMPRESS. COUPLER FOR CONNECT
5. FULL FLOW STOP VALVE (BY OWNER)
6. METER (BY RPU)
7. METER TAIL (BY RPU)
8. FULL FLOW STOP VALVE (BY OWNER)

TYPICAL RESIDENTIAL DETAILS



1. 1" CORPORATION STOP (BY OWNER)
2. 1" CURB VALVE (BY OWNER)
3. CURB BOX TAPPED 1 1/2" OR 2" (BY OWNER)
4. TEMP. CAP FOR TESTING–COMPRESS. COUPLER(BY OWNER)
5. 3/4" M.I.P. X 3/4" M.I.P. X 1" (BY OWNER)
6. WOOD "THERMALINE" HYDRANT OR EQUAL
7. FULL FLOW STOP VALVE (BY OWNER)
8. WATER METER (BY RPU)
9. METER TAIL (BY RPU)
10. FULL FLOW STOP VALVE (BY OWNER)

TYPICAL MANUFACTURED HOME DETAILS

DEPARTMENT OF PUBLIC WORKS
CITY OF ROCHESTER, MINNESOTA

WATER SERVICE AND METER SETTING DETAILS

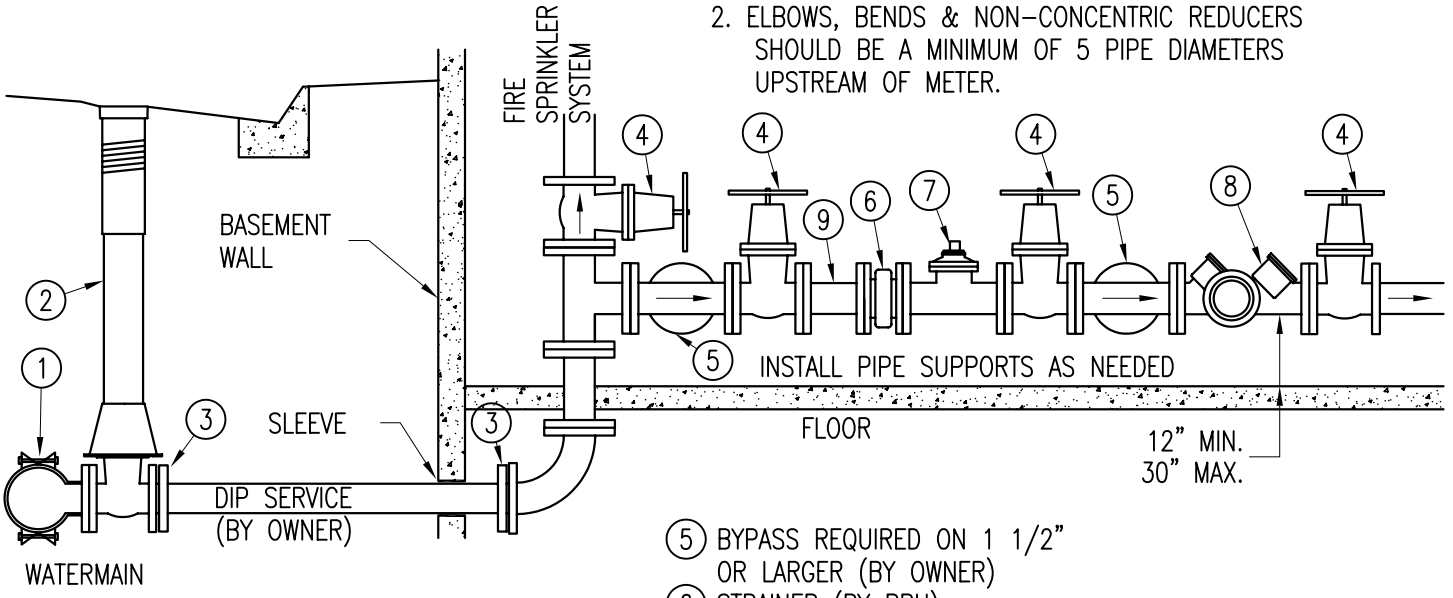
RPU–WATER UTILITY | DIRECTOR

SHT 1 OF 2 SHTS	DATE REVISED	PLATE NO.	REV.
	3/22/06	6–11	D

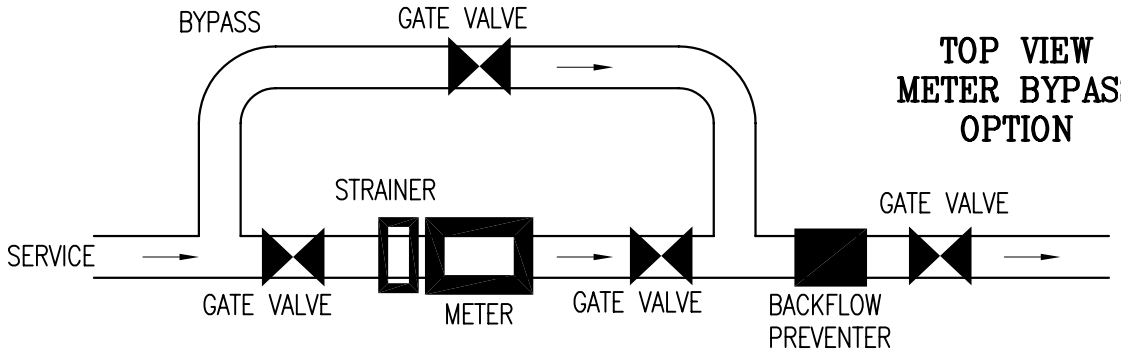
OWNER RESPONSIBLE FOR MAINTAINING TOP OF VALVE BOX FLUSH WITH STREET SURFACE

NOTES

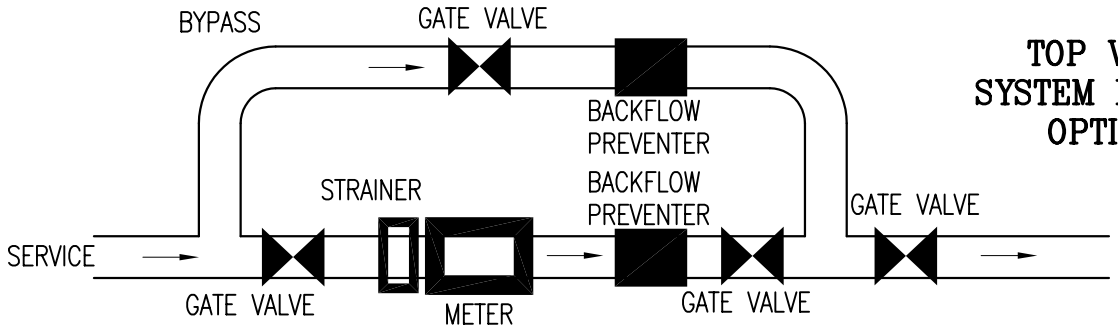
1. DO NOT INSTALL CHECK VALVES OR PRESSURE REDUCING DEVICES UPSTREAM AND LESS THAN 5 PIPE DIAMETERS DOWNSTREAM OF THE METER.
2. ELBOWS, BENDS & NON-CONCENTRIC REDUCERS SHOULD BE A MINIMUM OF 5 PIPE DIAMETERS UPSTREAM OF METER.



1. TAPPING SLEEVE & VALVE OR CUT-IN-TEE & VALVE (BY OWNER)
2. VALVE BOX (BY OWNER)
3. RETAINER GLAND (BY OWNER)
4. FULL FLOW VALVE (BY OWNER)
5. BYPASS REQUIRED ON 1 1/2" OR LARGER (BY OWNER)
6. STRAINER (BY RPU)
7. METER (BY RPU)
8. APPROVED BACKFLOW PREVENTER (BY OWNER)
9. MINIMUM 5 PIPE DIAMETERS UPSTREAM OF STRAINER



TOP VIEW METER BYPASS OPTION



TOP VIEW SYSTEM BYPASS OPTION

TYPICAL COMMERCIAL/ INDUSTRIAL DETAILS

DEPARTMENT OF PUBLIC WORKS
CITY OF ROCHESTER, MINNESOTA

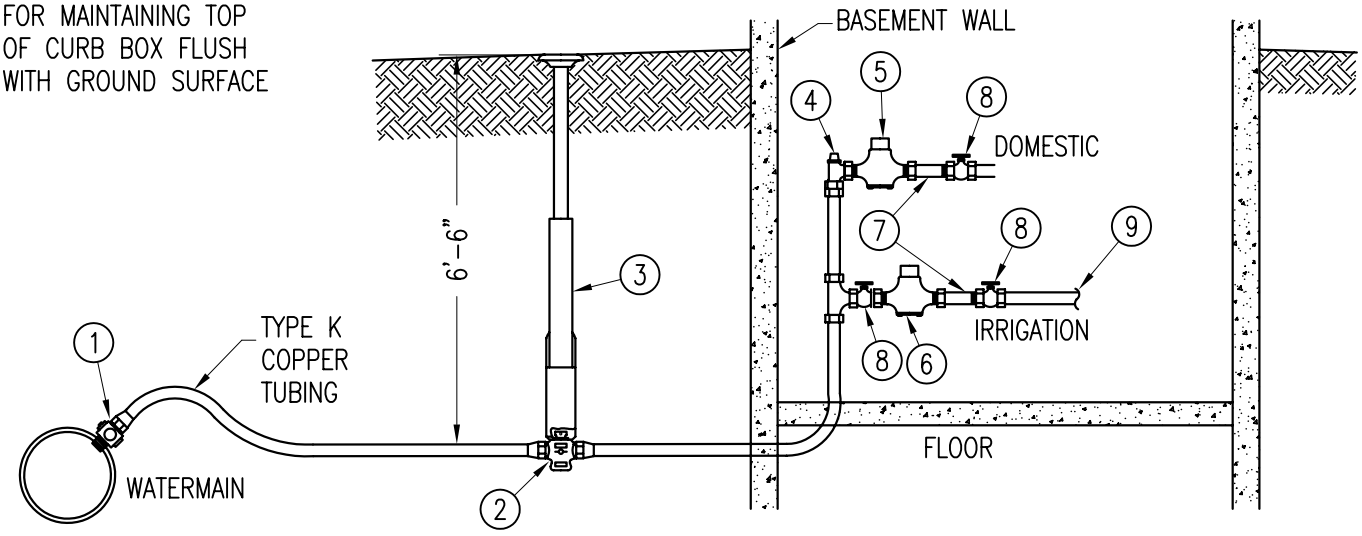
WATER SERVICE AND METER SETTING DETAILS

Douglas C. Rovang
RPU-WATER UTILITY

Russell W. Fries
DIRECTOR

SHT 2 OF 2 SHTS	DATE REVISED 4/1/04	PLATE NO. 6-11	REV. C

OWNER RESPONSIBLE FOR MAINTAINING TOP OF CURB BOX FLUSH WITH GROUND SURFACE

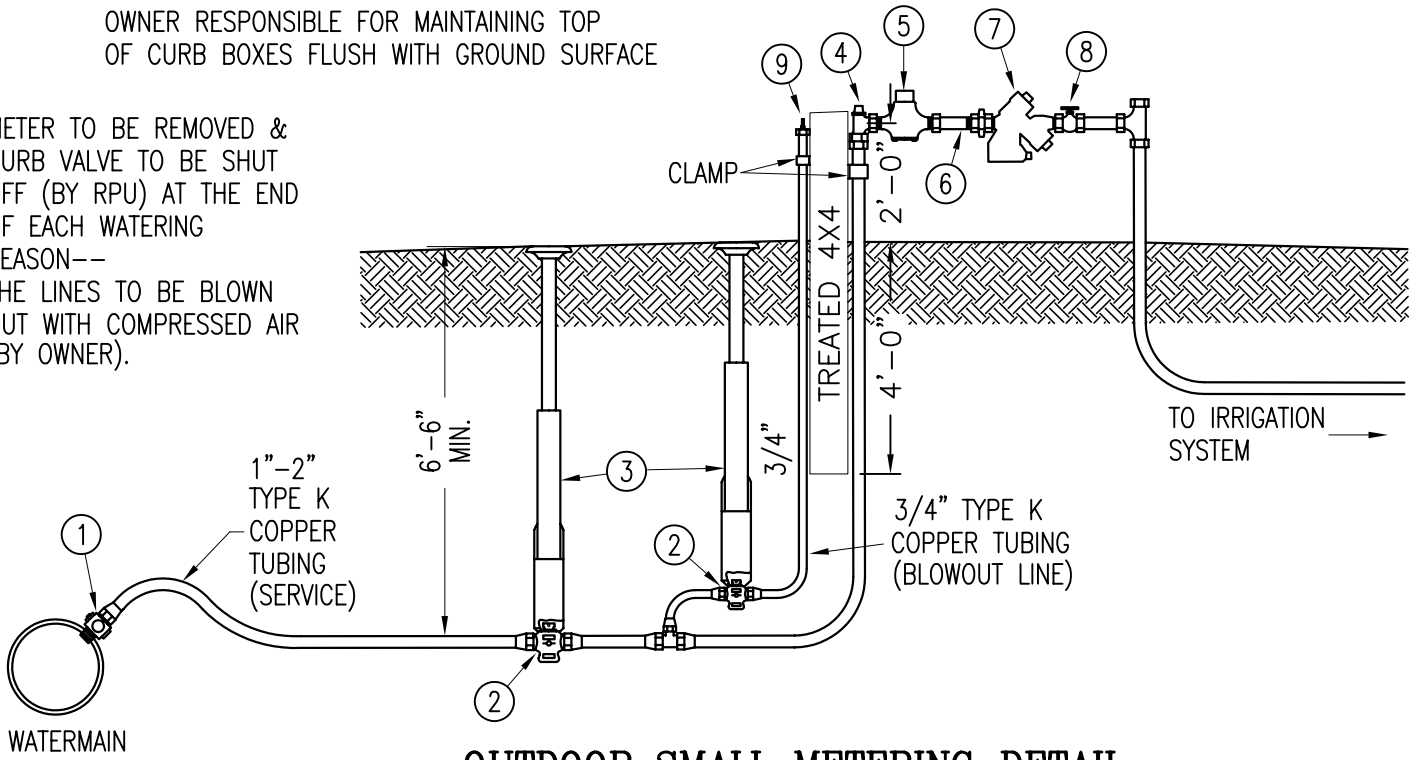


INDOOR METERING DETAIL

1. CORPORATION STOP (BY OWNER)
2. CURB VALVE (BY OWNER)
3. CURB BOX (BY OWNER)
4. FULL FLOW STOP VALVE (BY OWNER)
5. METER TO DOMESTIC SYSTEM (BY RPU)
6. METER TO IRRIGATION SYSTEM (BY RPU)
7. METER TAILS (BY RPU)
8. FULL FLOW STOP VALVE (BY OWNER)
9. APPROVED BACKFLOW PREVENTER (BY OWNER)

OWNER RESPONSIBLE FOR MAINTAINING TOP OF CURB BOXES FLUSH WITH GROUND SURFACE

METER TO BE REMOVED & CURB VALVE TO BE SHUT OFF (BY RPU) AT THE END OF EACH WATERING SEASON-- THE LINES TO BE BLOWN OUT WITH COMPRESSED AIR (BY OWNER).



OUTDOOR SMALL METERING DETAIL (SEASONAL USE ONLY)

1. CORPORATION STOP (BY OWNER)
2. CURB VALVE (BY OWNER)
3. CURB BOX (BY OWNER)
4. ANGLE STOP (BY OWNER)
5. METER (BY RPU)
6. METER TAIL (BY RPU)
7. APPROVED BACKFLOW PREVENTER (BY OWNER)
8. FULL FLOW GATE VALVE (BY OWNER)
9. AIR VALVE STEM FOR BLOWOUT (BY OWNER)

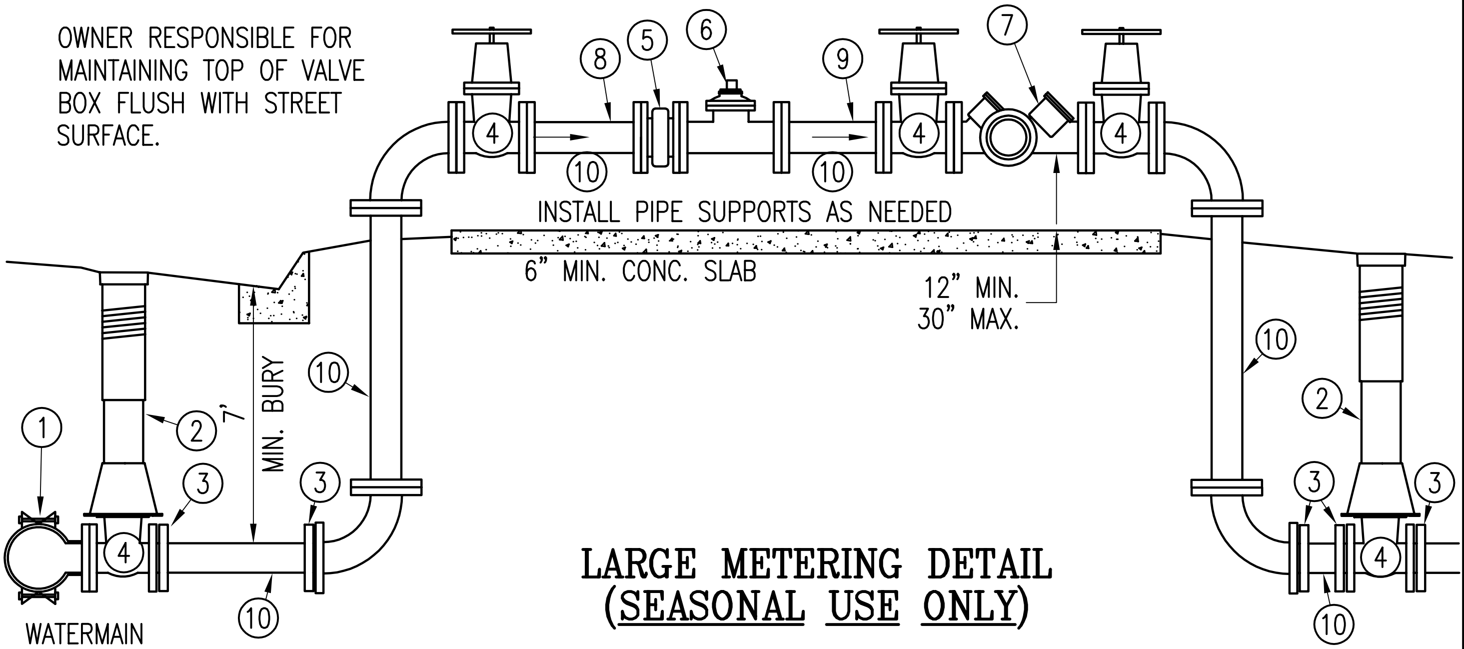
DEPARTMENT OF PUBLIC WORKS
CITY OF ROCHESTER, MINNESOTA

IRRIGATION SYSTEM

Douglas C. Rovang
RPU-WATER UTILITY

Russell W. Fries
DIRECTOR

SHT 1 OF 2 SHTS	DATE REVISED	PLATE NO.	REV.
	4/1/04	6-12	C



LARGE METERING DETAIL (<u>SEASONAL USE ONLY</u>)

1. TAPPING SLEEVE & VALVE OR CUT-IN-TEE & VALVE (BY OWNER)
2. VALVE BOX (BY OWNER)
3. RETAINER GLAND (BY OWNER)
4. FULL FLOW VALVE (BY OWNER)
5. STRAINER (BY RPU)
6. METER (BY RPU)
7. APPROVED BACKFLOW PREVENTER (BY OWNER)
8. MINIMUM 5 PIPE DIAMETERS UPSTREAM OF STRAINER
9. MINIMUM 2 PIPE DIAMETERS DOWNSTREAM OF METER
10. DUCTILE IRON PIPE SERVICE BY OWNER

NOTES

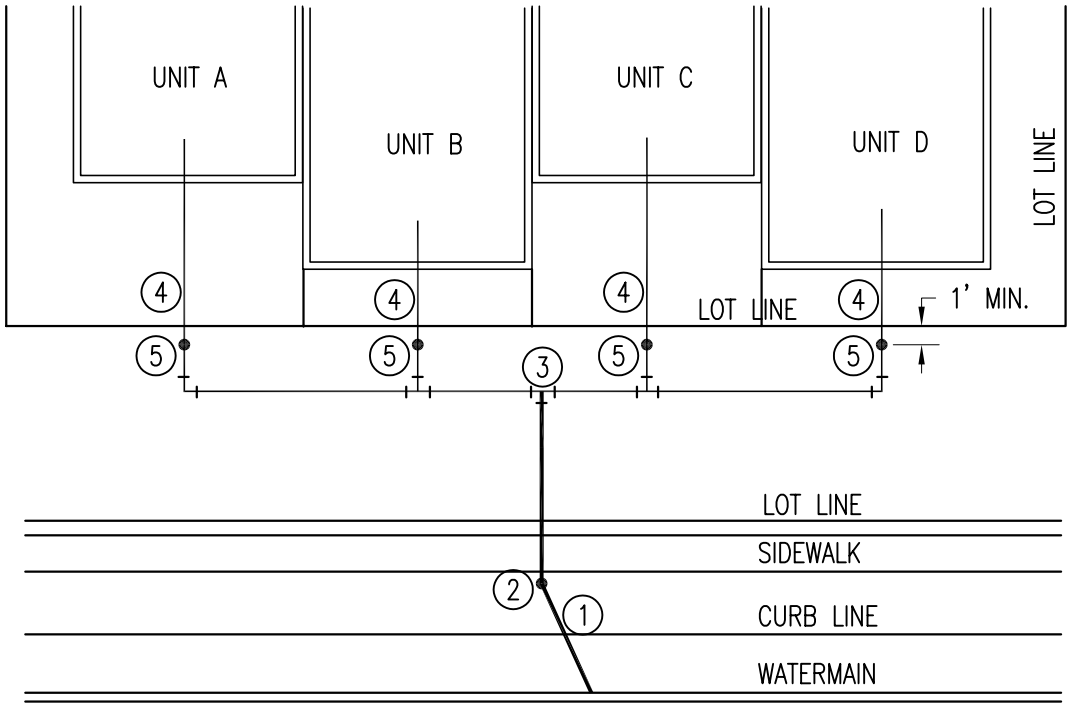
1. DO NOT INSTALL BACK FLOW PREVENTER UPSTREAM AND LESS THAN 5 PIPE DIAMETERS DOWNSTREAM OF THE METER.
2. ELBOWS, BENDS & NON-CONCENTRIC REDUCERS SHOULD BE A MINIMUM OF 10 PIPE DIAMETERS UPSTREAM OF METER.

DEPARTMENT OF PUBLIC WORKS
CITY OF ROCHESTER, MINNESOTA

IRRIGATION SYSTEM

Douglas C. Rovang — RPU-WATER UTILITY | [signature] — DIRECTOR

SHT 2 OF 2 SHTS	DATE REVISED	PLATE NO.	REV.
	4/1/04	6-12	C



1. MASTER SERVICE
2. MASTER CURB BOX
3. MASTER TEE (SPLIT FOR INDIVIDUAL UNIT SERVICES)
4. INDIVIDUAL SERVICES–MINIMUM 1"
5. INDIVIDUAL CURB BOXES

NOTE

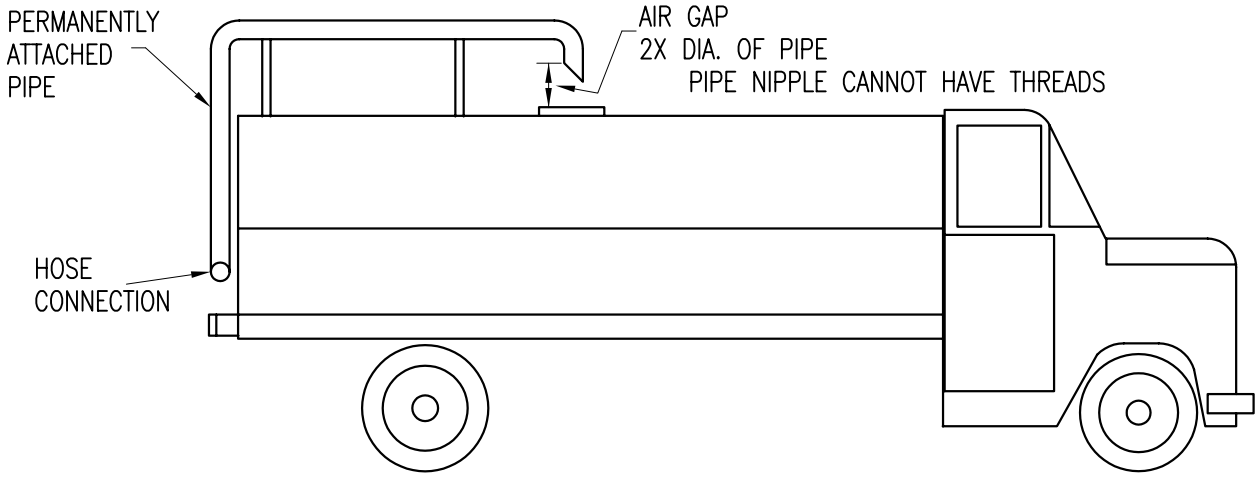
ALL SERVICE CONNECTIONS OF THIS TYPE SHALL BE REVIEWED BY RPU FOR PROPER SIZING PRIOR TO INSTALLATION. SERVICE FROM WATERMAIN TO BUILDING BY OWNER.

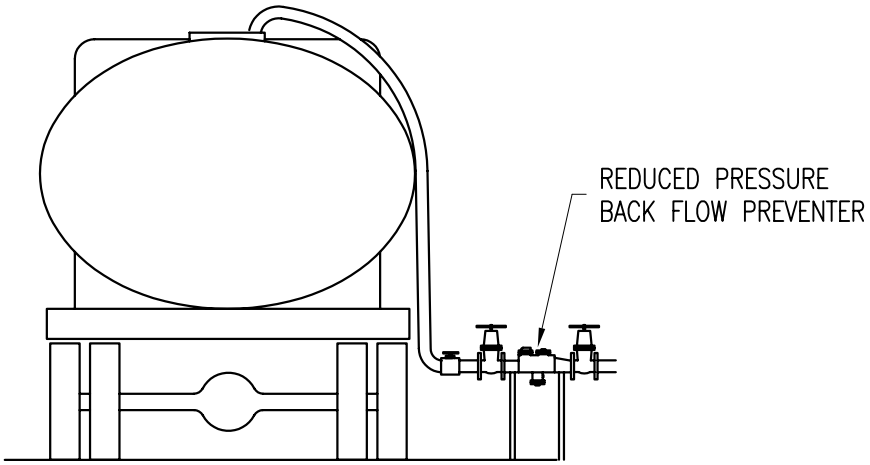
DEPARTMENT OF PUBLIC WORKS
CITY OF ROCHESTER, MINNESOTA

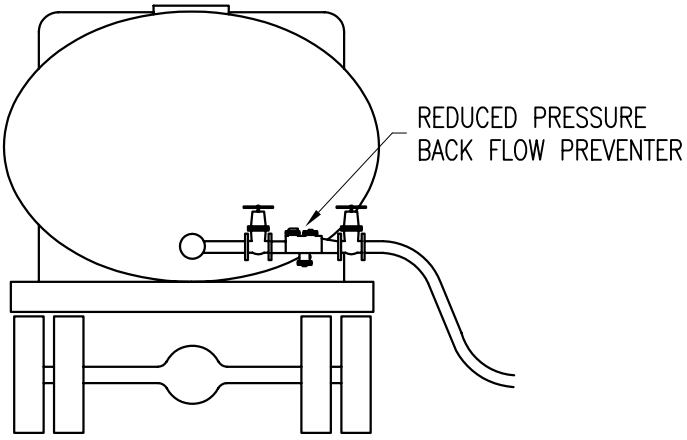
ALTERNATE SERVICE LAYOUT FOR MULTIPLE–UNIT BUILDINGS

Douglas C. Rovang	Russell W. Fries
RPU–WATER UTILITY	DIRECTOR

SHT 1 OF 1 SHTS	DATE REVISED	PLATE NO.	REV.
	6/15/07	6–13	C







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BACKFLOW PREVENTION FOR WATER TANKERS

Douglas C. Rovang	Russell W. Fries
RPO–WATER UTILITY	DIRECTOR

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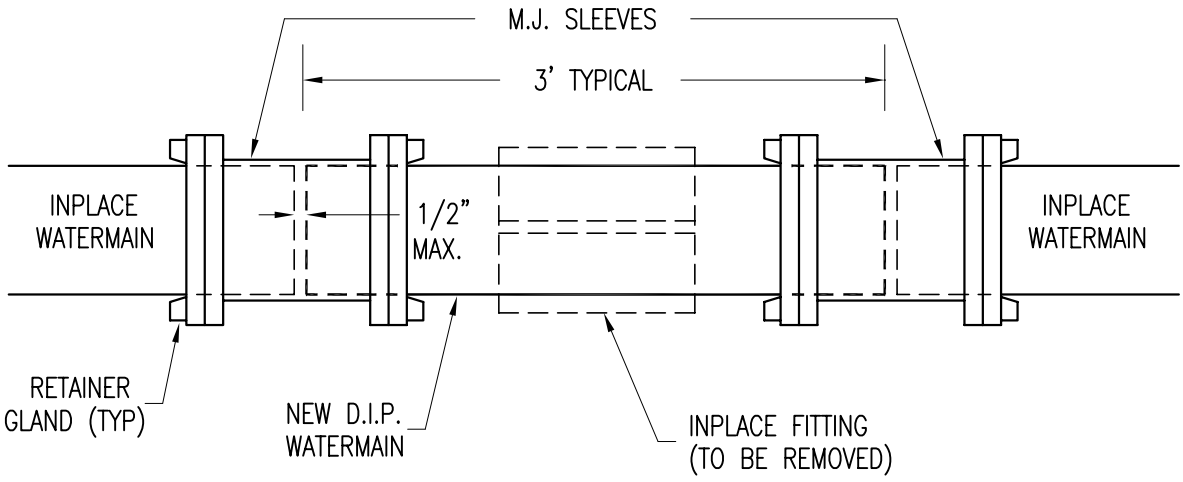
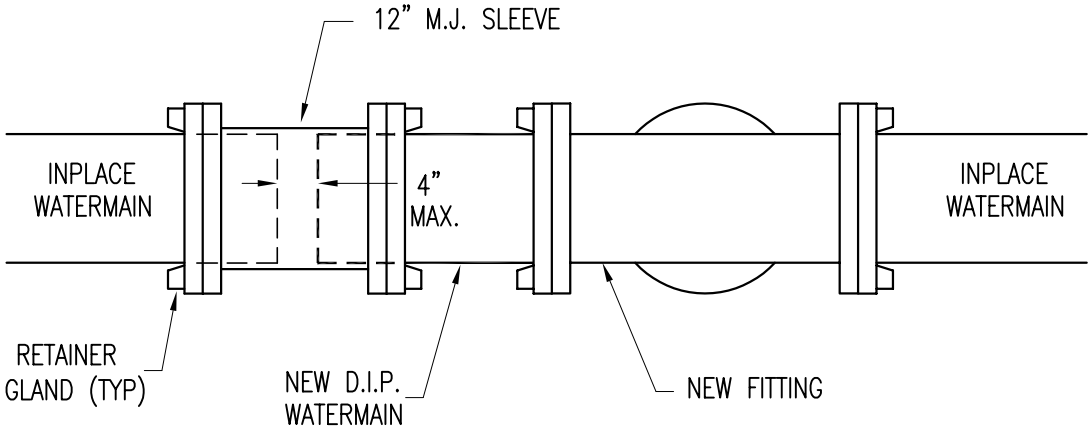


TYPICAL FITTING REMOVAL DETAIL



TYPICAL "CUT-IN" FITTING DETAIL

NOTE

1. USE 8" BLOCKING UNDER SLEEVES TO PREVENT SHEARING DUE TO SETTLEMENT.

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CITY OF ROCHESTER, MINNESOTA

TYPICAL FITTING CUT-IN AND REMOVAL DETAILS

Douglas C. Rovang	Russell W. Fries
RPU-WATER UTILITY	DIRECTOR

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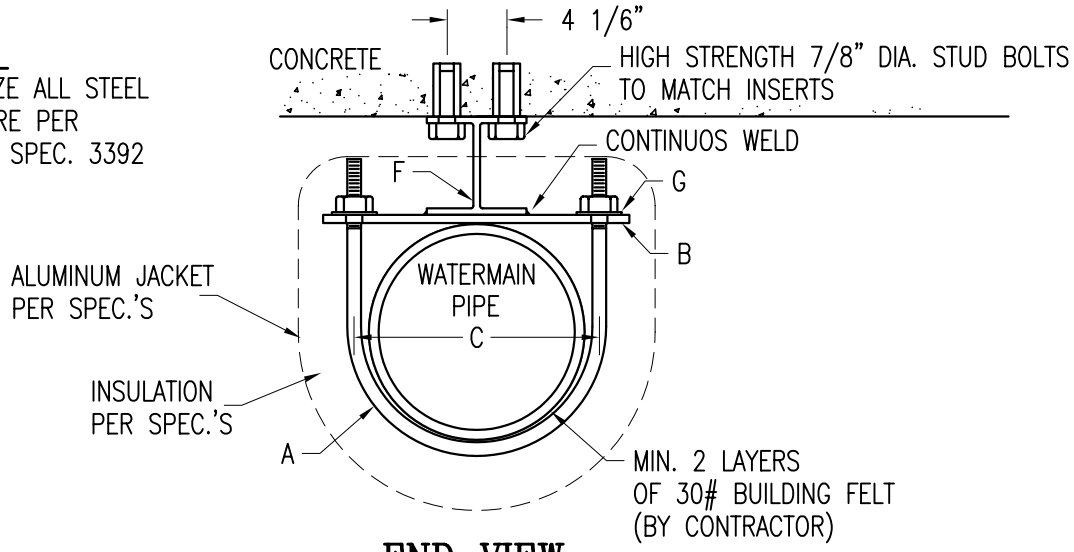
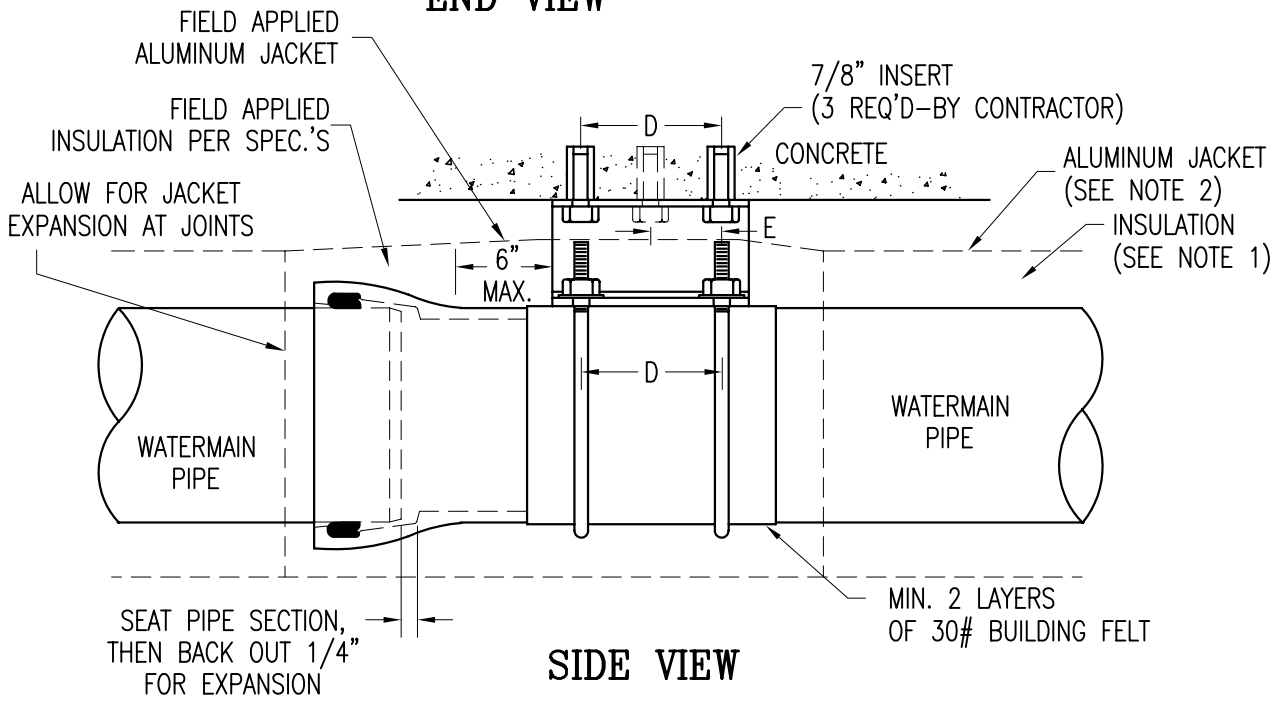
	10/1/97	6-15	A

NOTE

GALVANIZE ALL STEEL HARDWARE PER MN/DOT SPEC. 3392



END VIEW



SIDE VIEW

	8" WATERMAIN	12" WATERMAIN
A	3/4" x 10" STD. U-BOLT	7/8" x 14" STD. U-BOLT
B	15" x 12" x 1/2" STEEL PLATE	18" x 12" x 1/2" STEEL PLATE
	W/ 4-7/8" HOLES	W/ 4- 1" HOLES
C	11 5/8"	15"
D	9"	9"
E	4 1/2"	4 1/2"
F	W6 x 25 STEEL I-BEAM W/ 3-1" HOLES	W6 x 25 STEEL I-BEAM W/ 3-1" HOLES
G	DOUBLE 1/4" x 3/4" WASHERS (8 TOTAL)	1/4" x 3/4" WASHERS (4 TOTAL)

NOTE 1 – PIPE INSULATION-4" STYROFOAM, FABRICATED PER ASTM C-450 AND C-585.

NOTE 2 – ALUMINUM JACKETING-ASTM B-209, MINIMUM 0.016" THICKNESS; 40# POLY-CRAFT PAPER MOISTURE BARRIER IN INTERIOR SIDE; SECURED WITH STAINLESS STEEL BANDING.

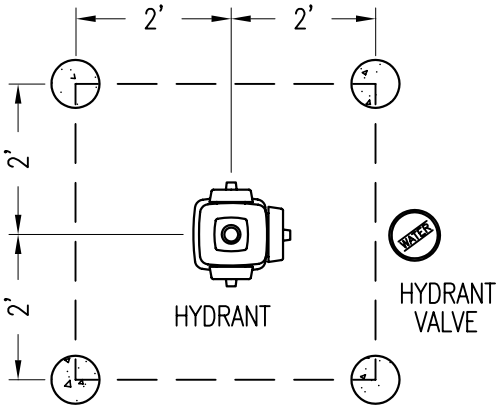
DEPARTMENT OF PUBLIC WORKS
CITY OF ROCHESTER, MINNESOTA

BRIDGE CROSSING PIPE HANGER DETAILS

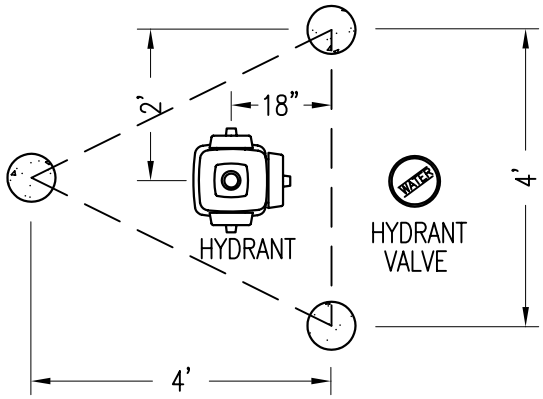
Douglas C. Rovang
RPU-WATER UTILITY

Russell W. Fries
DIRECTOR

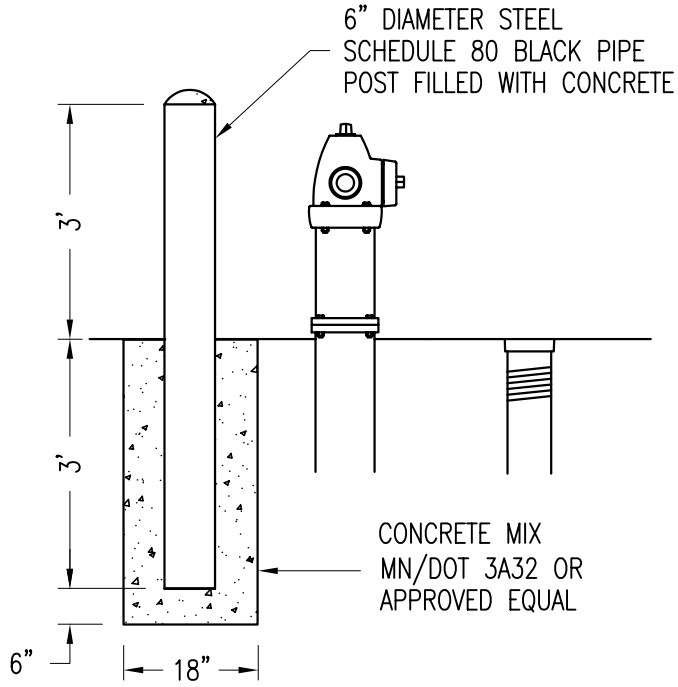
SHT 1 OF 1 SHTS	DATE REVISED 4/1/04	PLATE NO. 6-16	REV. C



4 POST LAYOUT



3 POST LAYOUT



SIDE VIEW

NOTE

CARE SHOULD BE TAKEN WHEN POSITIONING THE PROTECTIVE POSTS SO THAT THE HYDRANT NOZZLES ARE NOT OBSTRUCTED.

DEPARTMENT OF PUBLIC WORKS
CITY OF ROCHESTER, MINNESOTA

HYDRANT PROTECTIVE POSTS

Douglas C. Rovang	Russell W. Fries
RPU–WATER UTILITY	DIRECTOR

SHT 1 OF 1 SHTS	DATE REVISED 10/1/97	PLATE NO. 6–17	REV. A